

Notice of Allowability

Application No.

10/087,191

Examiner

Satya B Sastri

Applicant(s)

JAEGER, RICHARD E.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed on January 15, 2004.
2. ☒ The allowed claim(s) is/are 1,2,4-6 and 8-44.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

1. This office action is in response to the amendment filed on January 15, 2004. With the addition of new *claims 43 and 44* and cancellation of *claims 3 and 7, claims 1, 2, 4-6, 8-44 are now pending in the application*. In view of the amendment, rejection of *claims 38 and 39* under 35 U.S.C. 103 is withdrawn, rejection of *claims 1-23, 26-39, 4, 42* 35 U.S.C. 103(a) as being unpatentable over Dershem et al. (US 5,232,962) in view of Dershem et al. (US 6,034,194) is withdrawn, rejection of *claims 24, 25* are rejected under 35 U.S.C. 103(a) as being unpatentable over Dershem et al. (US 5,232,962) in view of Dershem et al. (US 6,034,194) and Dershem et al. (US 5,717,034) is withdrawn and rejection of *claims 1-6, 12-20, 8-39, 41, 42* under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Dershem et al. (US 5,717,034) is also withdrawn.

Allowable Subject Matter

2. *Claims 1, 2, 4-6, 8-44* are allowed.

3. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest reference: Dershem et al. (US 5,232,962) and Dershem et al. (US 6,034,194).

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The present invention discloses an adhesive composition comprising at least one maleimide-containing monomer, optionally at least one cure initiator, and a plurality of spacers constructed from one or more organic polymers (*claim 1*).

The prior art to Dershem et al. ('962) is in regard to adhesive composition with bond line limiting spacer having a hardenable adhesive component and a plurality of spacers, the bond line thickness being maintained at a selected limit by the spacer elements. The disclosure further includes that the adhesive vehicle and spacer elements may be formed from many different materials depending on the nature of the materials to be bonded and the bonding composition itself. An example of the adhesive vehicle includes an epoxy resin. The spacer element may be collapsible and based on organic polymers such as collapsible spheroids made from polypropylene carbonate and polyalkyl methacrylate resins. The plastics determined to be useful as collapsible spacer elements may be non-charring, depolymerizable polymers having relatively low softening point, between 35-105°C. Working example 1 includes polyisobutyl methacrylate particles which are spherical in shape and classified to a mesh size of -100 to +200 mesh. A semiconductor die-attach bonding composition comprising adhesive paste composition may be used in bonding a pair of surfaces in a semiconductor device.

The prior art to Dershem et al. ('034) discloses adhesive formulations comprising perfluorinated hydrocarbon polymers as fillers, a curing catalyst and optionally other additives such as coupling agents, additional fillers etc. Monomer vehicles for use in the composition may be based on maleimides, (meth)acrylates, propargyl ether materials, silicone based adhesive formulations etc. The polymer particle is further characterized as having a particle size in the

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range of about 0.1 up to about 100 μm . The method of adhesively attaching a microelectronic device to a substrate, assemblies comprising cured adhesive and a variety of substrates are disclosed.

Neither prior art teaches a combination of a maleimide-based adhesive composition and a plurality of spacers constructed from one or more organic polymers as disclosed in the instant invention. Therefore, the instantly claimed invention is deemed allowable over the closest prior art of record as per said art neither anticipating nor rendering obvious the instantly claimed adhesive composition comprising at least one maleimide-containing monomer, optionally at least one cure initiator, and a plurality of spacers constructed from one or more organic polymers. There is no teaching or suggestion or motivation to modify the prior art compositions so as to deduce the instantly claimed adhesive composition of the present invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at (571) 272-1112.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached at (571) 272-1114.

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Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 308-0661.



SATYA SASTRI

February 9, 2004



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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700